1979

Preliminary study on the internal genital organ of the giant tiger prawn, Penaeus monodon

Motoh, H.

Aquaculture Department, Southeast Asian Fisheries Development Center

Motoh, H. (1979). Preliminary study on the internal genital organ of the giant tiger prawn, Penaeus monodon. SEAFDEC Aquaculture Department Quarterly Research Report, 3(1), 15–18.

http://hdl.handle.net/10862/2341

Preliminary study on the internal genital organ of the giant tiger prawn, *Penaeus monodon*

H. Motoh

Shrimp has become the most valuable fishery product in the Philippines. The giant tiger prawn, *Penaeus monodon* is particularly of commercial importance owing to its palatability, large size, rapid growth and great tolerance to the physico-chemical parameters in the brackish fishpond.

This report gives information on the anatomy of the internal genital organs of *P. monodon.*

The prawns used for the present study were caught in fish corrals at the mouth of Batan Bay. Within an hour after capture they were preserved in 10% formalin solution diluted with sea water. Several days after the field trip, they were carefully dissected with scissors and tweezers in the laboratory and drawn by freehand.

Male: The male reproductive system consists of internal genital organs, e.g. paired testes, paired vas deferens, in addition to the external ones e.g. a petasma and paired appendix masculina. The testes are unpigmented, translucent organs occupying a position in the body cavity very similar to that of the ovaries in the females. However, the testes are located only in the cephalothorax portion. Each testis has an anterior lobe and five lateral lobes without paired single short posterior lobe which are projecting from the main axis in *P. setiferus* (King, 1948).

The vas deferens arises from the posterior margins of the main axes of the testes and opens to the exterior through genital pores located medially on the coxopods of the 5th pereiopods. Each vas deferens consists of four distinct portions: a short, narrow, proximal portion (proximal vas deferens), a thickened large medial portion having a double fexure (medial vas deferens); a relatively long narrow tube (distal vas deferens); and a greatly chilated muscular portion (terminal ampoule).

The terminal ampoule possesses a thick muscular wall lined with extremely tall columnar epithelial cells.

The paired testes lies in the cephalothorax and has a lateral lobe which descends over the hepatopancreas.

It is believed that sperm transfer takes place between a hard male and a soft female. Hudinaga (1942) and Cummings (1961) indicated that impregnation occurs between hard males and soft females. Primavera (1978) also observed the courtship and mating behavior of *P. monodon* which occurred between hard-shelled male and softshelled female in captivity.

Once a male reaches sexual maturity, the testes produce a continuous crop of spermatozoa. At almost anytime of the year, the terminal ampoules possess spermatozoa.

The spermatozoon is composed of two parts: head and tail. The head is large and almost circular in outline showing about 3 micron, while the tail is relatively thick and short. Although it is a logical assumption that the spermatozoa is capable of movement, the present author never observed the spermatozoa moving under a microscope with high magnification (x600).

Female: The female reproductive system consists of paired ovaries, paired oviducts and a single thelycum, the last is an external organ. The ovaries are partly fused, bilaterally symmetrical bodies extending in the mature female for almost its entire length, from the cardiac region of the stomach to the anterior portion of the telson. In the cephalothoracic region each organ bears a

slender anterior lobe and mostly six or seven finger-like lateral projections. A pair of lobes, one from each ovary, extends over the length of the abdomen. The anterior lobes lie closely to the esophagus and cardiac region of the stomach. The lateral lobes are located dorsally in the large mass of hepato-pancreas and ventrally in the pericardiac chamber. The abdominal extensions lie dorso-lateral to the intestine and ventro-lateral to the dorsal abdominal artery.

The oviducts originate at the tips of the 6th or 7th lateral lobes and descend to the external apertures hidden in the ear-like lobes of the coxopods of the 3rd pair of pereiopods.

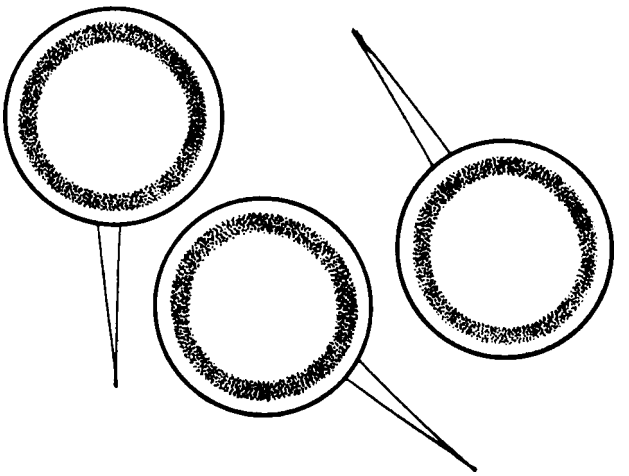

Fig. 1. Diagram of spermatozoa of *Penaeus monodon*.

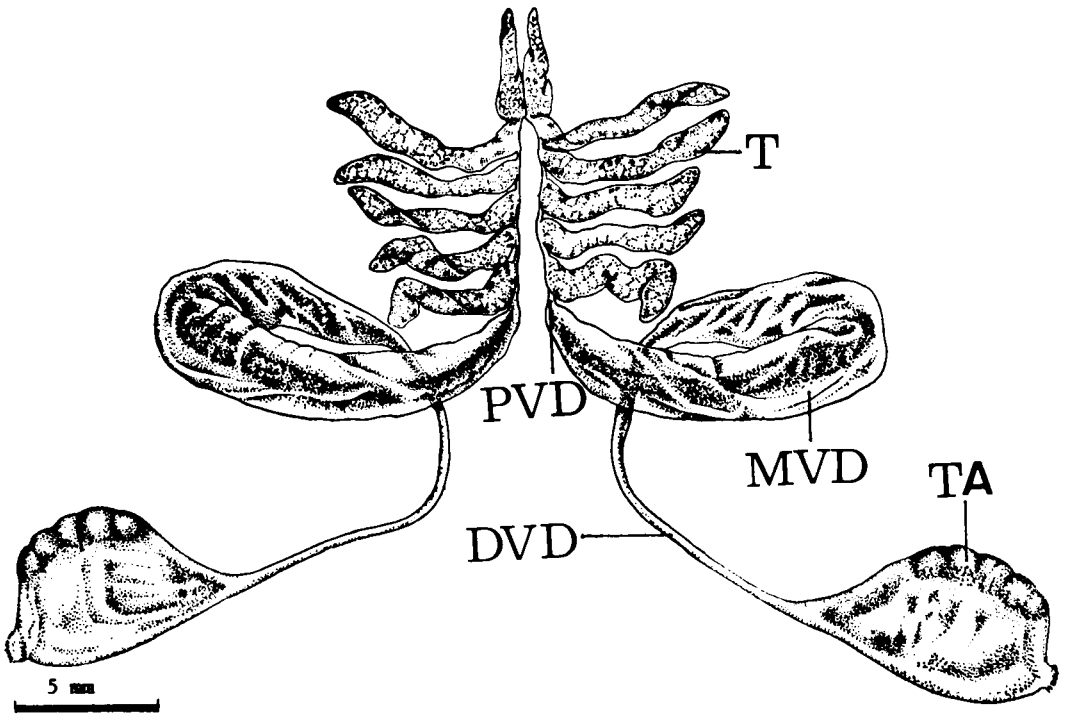

Fig. 2. Male reproductive system of *Penaeus monodon*. T, testis; PVD, Proximal vas deferens; MVD, Medial vas deferens; DVD, Distal vas deferens; TA, terminal ampoule.

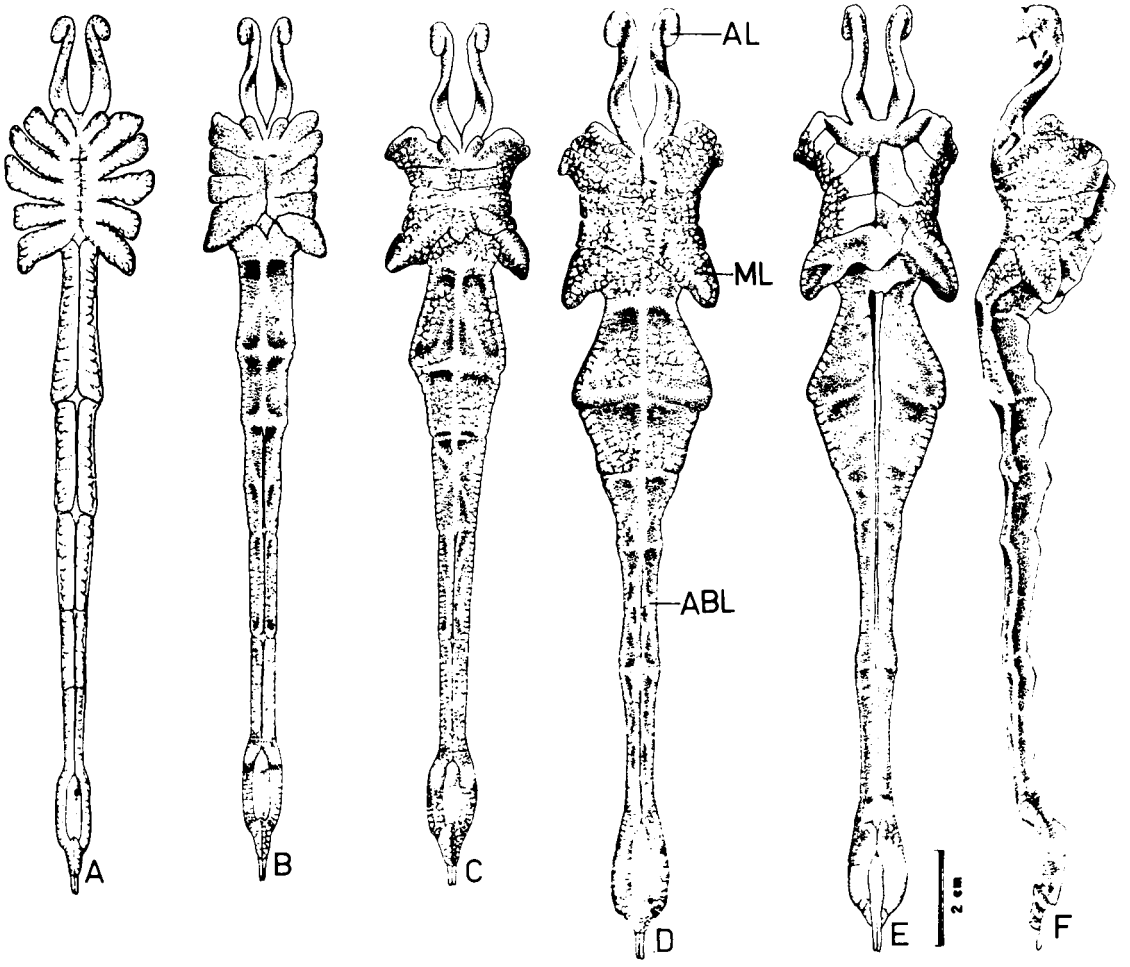

Fig. 3. Ovarian development of *Penaeus monodon*. A, Undeveloped and/or spent stage (dorsal view); B, Developing stage (dorsal view); C, Nearly ripe stage (dorsal view); D, Ripe stage (dorsal view); E, Ripe stage (ventral view); F, Ripe stage (lateral view). AL, Anterior lobe; ML, Medial lobe; ABL, Abdominal lobe.

REFERENCES

Aquacop (1977). Observations on the maturation and reproduction of penaeid shrimp in captivity in the tropical region. Actes de Colloques du C.N.E.X.O., 4:157-178 (in French with English Summary).

Cummings, W. C. (1961). Maturation and spawning of the pink shrimp, *Penaeus duorarum* Burkenroad. Trans. Amer. Fish. Soc., 9(4):462-468.

King, J. E. 1948). A study of the reproductive organ of the common marine shrimp, *Penaeus setiferus* (LINNAEUS). Biol. Bull., 94(3): 244-262.

Liao, I. E. (1973). Notes on the cultured spawner of red-tailed prawn *Penaeus penicillatus* Alcock. Chinese American Joint Commission on Rural Reconstruction Fisheries Series, No. 15:59-65 (in Chinese with English Summary).

Oka, M. and S. Shirohata (1964). Studies on *Penaeus orientalis* Kishinouye-I. Seminal mechanism and its function. Bull. Fac. Fish. Nagasaki, Univ., No. 17:55-69 (in Japanese with English Summary).

Oka, M. and S. Shirohata (1965). Studies on *Penaeus orientalis* Kishinouye-I. Morphological classification of the ovarian eggs and the maturity of the ovary. Bull. Fac. Fish. Nagasaki Univ., No. 18:30-40 (in Japanese with English Summary).

Primavera, J. H. (1978). Courtship and mating behavior in *Penaeus monodon* Fabricius. Quaterly Research Report of Aquaculture Dept., SEAFDEC, 2(2): 6-9.

Santiago, A. C. Jr., L. Rodriguez, R. Mateo, and R. Obregon (1976). Development of a broodstock of the jumbo tiger prawn, *Penaeus monodon* Fabricius. Technical Report of Aquaculture Dept., SEAFDEC, No. 1: 16 pp.

Subrahmanyam, C. B. (1965). On the reproductive cycle of *Penaeus indicus* (H. EDW). J. Mar. Biol. Ass. India, 7(2): 284-290.